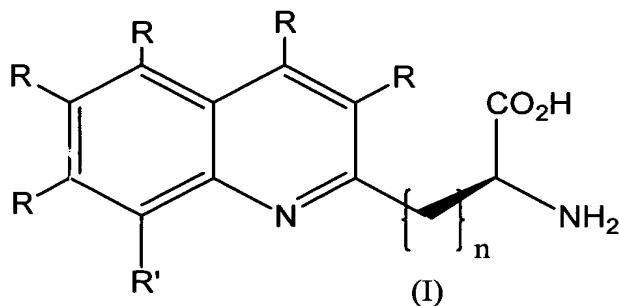


CLAIMS

1. A compound of the formula (I):



where at least one R group is $-\text{SO}_2\text{X}$, where X is $-\text{OR}''$ or $-\text{NR}''\text{R}'''$;

R' is hydroxy, amino, or thiol;

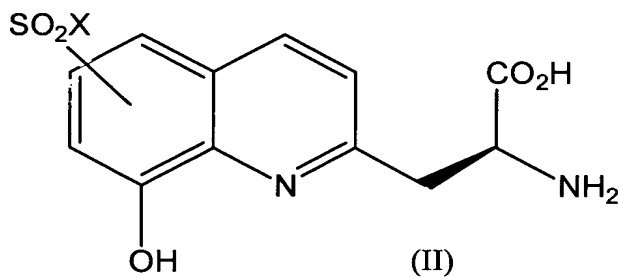
R'' is C_{1-6} alkyl;

R''' is hydrogen or alkyl; and

n is 1, 2 or 3; and

wherein compound (I) undergoes chelation-enhanced fluorescence (CHEF) upon binding to Mg^{2+} .

2. The compound of claim 1, which is of the formula (II):

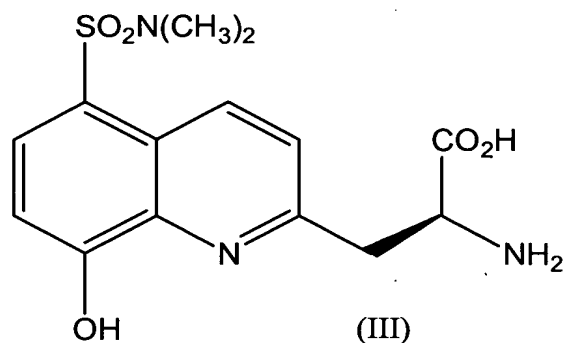


where X is $-\text{OR}''$ or $-\text{NR}''\text{R}'''$;

R'' is C_{1-6} alkyl; and

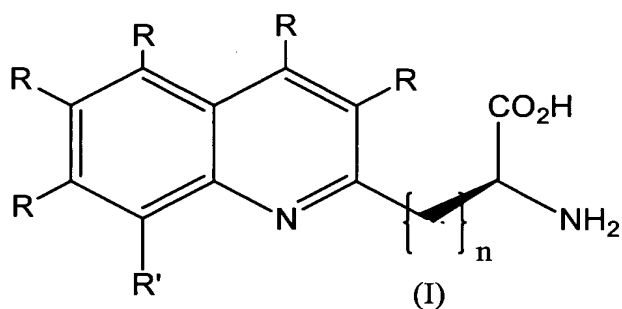
R''' is hydrogen or C_{1-6} alkyl.

3. The compound of claim 1, which is of the formula (III):



4. A peptide comprising:

(a) an amino acid of the formula (I):



where at least one R group is $-\text{SO}_2\text{X}$, where X is $-\text{OR}''$ or $-\text{NR}''\text{R}'''$;

R' is hydroxy, amino, or thiol;

R'' is C_{1-6} alkyl;

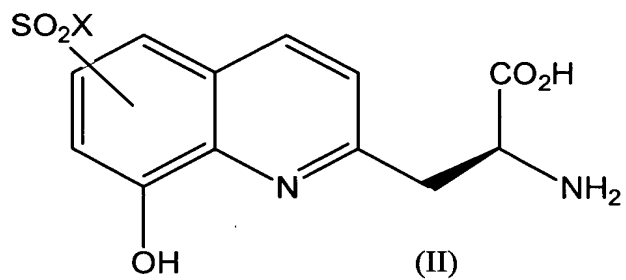
R''' is hydrogen or alkyl; and

n is 1, 2 or 3; and

(b) a β -turn sequence.

5. The peptide of claim 4, further comprising a kinase recognition sequence.

6. The peptide of claim 4, wherein the metal binding amino acid is of the formula (II):

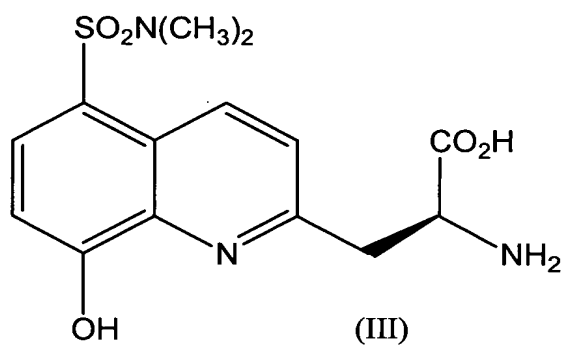


where X is -OR'' or -NR''R''';

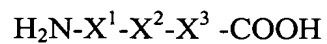
R'' is C₁₋₆ alkyl; and

R''' is hydrogen or C₁₋₆ alkyl.

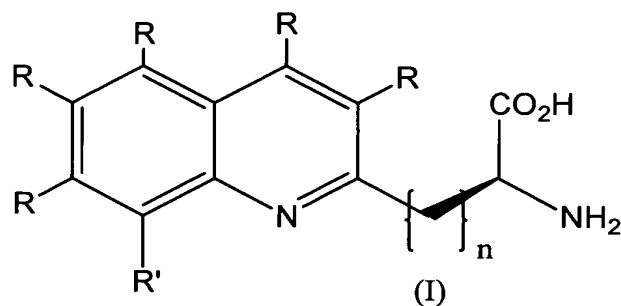
7. The peptide of claim 4, wherein the metal binding amino acid is of the formula (III):



8. The peptide of claim 4, which comprises the sequence (SID No. 8):



where X¹ is an amino acid of the formula (I)



where at least one R group is -SO₂X, where X is -OR'' or -NR''R''';

R' is hydroxy, amino, or thiol;

R'' is C₁₋₆ alkyl;

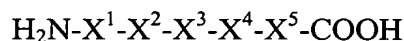
R''' is hydrogen or alkyl; and

n is 1, 2 or 3; and

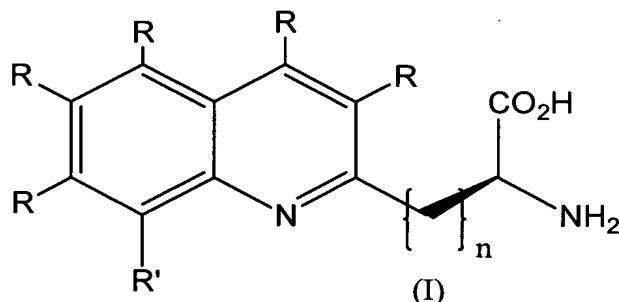
X² and X³ are each, independently, amino acid residues which together form a β-turn sequence.

9. The peptide of claim 8, which comprises the sequence -Sox-Pro-Gly-.

10. The peptide of claim 4, which comprises the sequence (SID No. 9):



where X¹ is an amino acid of the formula (I)



where at least one R group is -SO₂X, where X is -OR'' or -NR''R''';

R' is hydroxy, amino, or thiol;

R'' is C₁₋₆ alkyl;

R''' is hydrogen or alkyl; and

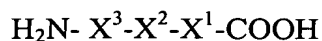
n is 1, 2 or 3;

X² and X³ are each, independently, amino acid residues which together form a β-turn sequence;

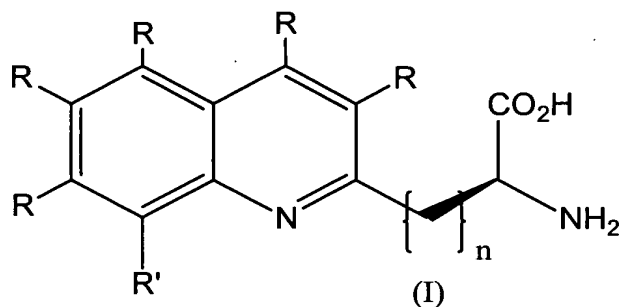
X⁴ is a bond or an amino acid residue; and

X⁵ is peptidyl kinase recognition motif, where the hydroxyl amino acid of the recognition motif is connected to X⁴.

11. The peptide of claim 4, which comprises the sequence (SID No. 10):



where X^1 is an amino acid of the formula (I)



where at least one R group is $-SO_2X$, where X is $-OR''$ or $-NR''R'''$;

R' is hydroxy, amino, or thiol;

R'' is C_{1-6} alkyl;

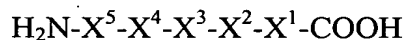
R''' is hydrogen or alkyl; and

n is 1, 2 or 3;

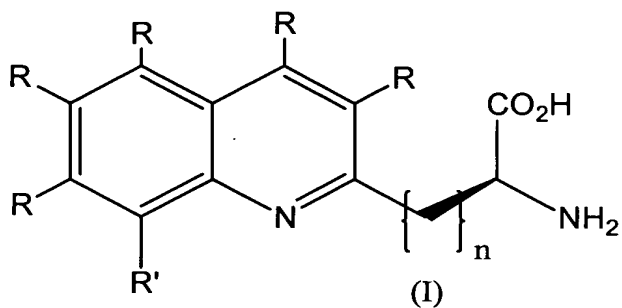
X^2 and X^3 are each, independently, amino acids which together form a β -turn sequence.

12. The peptide of claim 11, which comprises the sequence -Leu-Pro-Sox-.

13. The peptide of claim 4, which comprises the sequence (SID No. 11):



where X^1 is an amino acid of the formula (I)



where at least one R group is $-SO_2X$, where X is $-OR''$ or $-NR''R'''$;

R' is hydroxy, amino, or thiol;

R'' is C_{1-6} alkyl;

R''' is hydrogen or alkyl; and

n is 1, 2 or 3;

X^2 and X^3 are each, independently, amino acids which together form a β -turn sequence;

X^4 is a bond or an amino acid residue; and

X^5 is peptidyl kinase recognition motif, where the hydroxyl amino acid of the recognition motif is connected to X^4 .

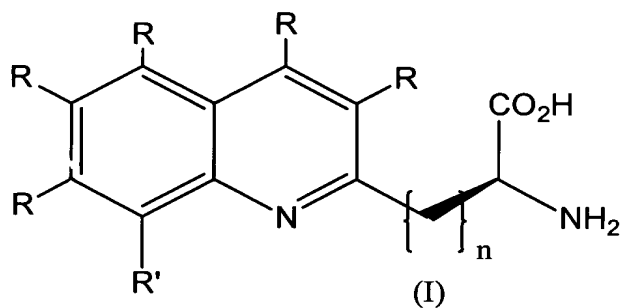
14. A method for detecting kinase activity, comprising the steps of:

(a) providing a peptide comprising:

(1) a kinase recognition sequence containing a phosphorylation site

(2) a β -turn sequence; and

(3) an amino acid of the formula (I):



where at least one R group is $-\text{SO}_2\text{X}$, where X is $-\text{OR}''$ or $-\text{NR}''\text{R}'''$;

R' is hydroxy, amino, or thiol;

R'' is C_{1-6} alkyl;

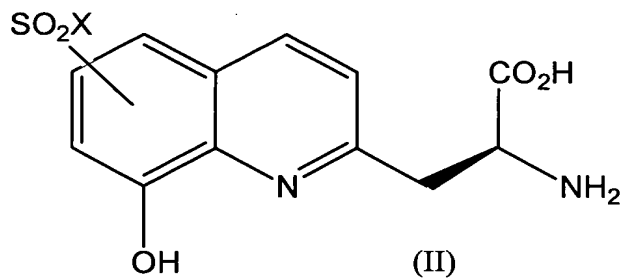
R''' is hydrogen or alkyl; and

n is 1, 2 or 3;

(b) contacting the peptide with a sample comprising Mg^{2+} , a phosphate source, and a kinase; and

(c) analyzing for the presence of a phosphorylated peptide product.

15. The method of claim 14, wherein the amino acid is of the formula (II):

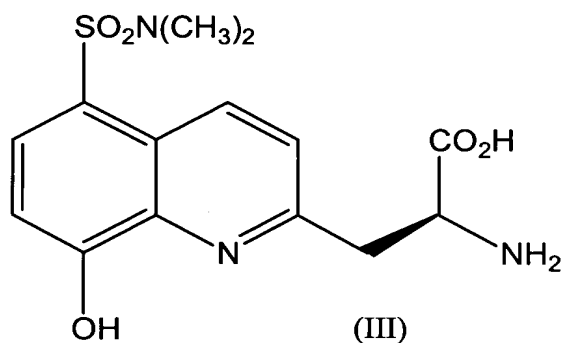


where X is -OR'' or -NR''R''';

R'' is C₁₋₆ alkyl; and

R''' is hydrogen or C₁₋₆ alkyl.

16. The method of claim 14, wherein the amino acid is of the formula (III):



17. The method of claim 14, wherein fluorescence of the peptide increases by at least about 100% when bound to Mg²⁺.

18. The method of claim 14, wherein the K_m of the peptide for the kinase is in the micromolar range.